

MRF Upgrade, Addition of a Glass Sorter

CIF Project #876



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Project Background:

As a part of the ongoing commitment to recycling, the City Of Guelph has been upgrading their MRF processing equipment at the Dunlop Drive recycling facility with an aim to achieving improved diversion rates and productivity. One of the challenges the MRF faced was excessive residue in the glass stream which was causing rejections from Nexcycle due to the high contamination rate. The glass had to be sent to the landfill at a cost of \$57.35 per tonne.

The Scope of Project # 876 which has been funded by the Continuous Improvement Fund and the City of Guelph was to install a Glass Sorter within the Container Sorting process which would automatically separate the residue, other recyclables and shredded paper from the mixed broken glass. The goal of this project was to decrease the residue rate of over 20 to 30% in the glass down to 10% or less keeping the limits within the acceptable rate that Nexcycle can tolerate in their processing system. The justification for the cost of this project was calculated by offsetting the landfill disposal cost of the entire glass stream against the lower processing cost of the clean glass at Nexcycle, additional revenues from the aluminum and other recyclables recovered from the glass stream as well as reduced labour costs. The other motivation of this project was to increase the diversion rate of recyclables from the landfill.

The City Of Guelph entered into a contract with Van Dyk Baler Corporation of Stamford Connecticut to make the necessary plant modifications and install a new Broken Glass Clean-up System at a cost of approximately \$ 893,725.00 plus HST. This cost also included the repurposing of the existing TiTech Optical Glass Separator to separate other valuable recyclables from the container stream which resulted in a permanent staff reduction of 2 full time sorters.

Implementation:

As part of the requirement for CIF funding, the city was required to provide 5 pre-project audits from Nexcycle proving that the contamination rate was exceeding 20% (well above Nexcycle's acceptable rate of 10%) as well as 5 post-project audits from Nexcycle to demonstrate the success of the project after the installation of the new separator is completed.

Audit Results:

Residue audits were carried out before and after the installation concluding that the installation of the Glass Cleanup System and Repurposing of the TiTech Optical Sorter was successful in achieving the predicted results. The chart on page 3 summarizes results of the project. The pre-project audits were also completed in the first half of 2014 and the results were submitted with the application for funding in early 2015. The 5 Pre-project audits indicated that non glass residue levels ranged between 16% to 29%, well above acceptable levels set out by Nexcycle, see appendix 1 on page 4. After the new glass cleanup system was installed and the TiTech Optical Sorter was repurposed, 5 post project audits were conducted by Nexcycle indicating that the non glass residue had reduced to between 4% to 6%, well below their threshold for rejection, see appendix 2 on page 4.

General Comments:

The overall benefits of this project include higher diversion rates thus lowering landfill costs, increasing the capture of valuable recyclables and lower labour costs due to the reduction of two full time sorters. The chart below illustrates the increased diversion of 2720 tonnes (primarily glass) from the land fill to markets that will recycle these products. This has reduced the City of Guelph's landfill cost by \$ 128,712.00 per year. Although the main purpose of this project was to clean up the glass to a level acceptable to markets, it also has been successful in recovering other recyclables that were contained in the glass stream. The most notable was the additional 100 tonnes of aluminum per year resulting in an annual revenue of approximately \$166,600.00. The reduction in labour cost has been another significant contribution to the success of the project, see appendix 3 on page 5. The savings in expenses and revenue gains from aluminum alone, resulting from this project has produced a financial gain of just under \$ 400,000.00 per year showing a payback of less than 3 years.

PROJECT SUMMARY OF ANNUAL COSTS, SAVINGS AND DIVERSION FOR THE GLASS CLEANUP SYSTEM	Annual Tonnage	Disposal Cost per Tonne	Aluminum Revenue per Tonne	Total Expense	Total Revenue
Total Incoming contaminated glass stream 2016	3900	\$ 57.35		\$ 223,665.00	
Residue from incoming glass	1180	\$ 57.35		\$ 67,673.00	
Remaining other recyclables in the glass	240				
Net glass tonnage directed to Nexcycle	2480	\$ 11.00		\$ 27,280.00	
Savings in landfill cost					\$ 128,712.00
Gain from aluminum removed from glass	100		\$ 1,666.00		\$ 166,600.00
Annual labour savings by the reduction of 2 sorters					\$ 98,729.00
Annual revenue gain from new glass system					\$ 394,041.00
Annual tonnage diverted from the landfill	2720				

Summary:

The new Glass Cleanup System has proved to be a reliable technology that has delivered consistent results. Other than routine housekeeping, the system has been trouble free with very low maintenance costs allowing the City to produce a mixed broken glass product with a non glass residue percentage well below Nexcycle's threshold for rejection. It has been determined that this project has been successful in achieving the results that were originally projected. The increased recovery rates of Glass, Aluminum and other containers along with the operational cost savings have come in better than expected along with the additional benefit of increased capture rates in other products. The City of Guelph would like to thank the CIF for the financial support with this project.

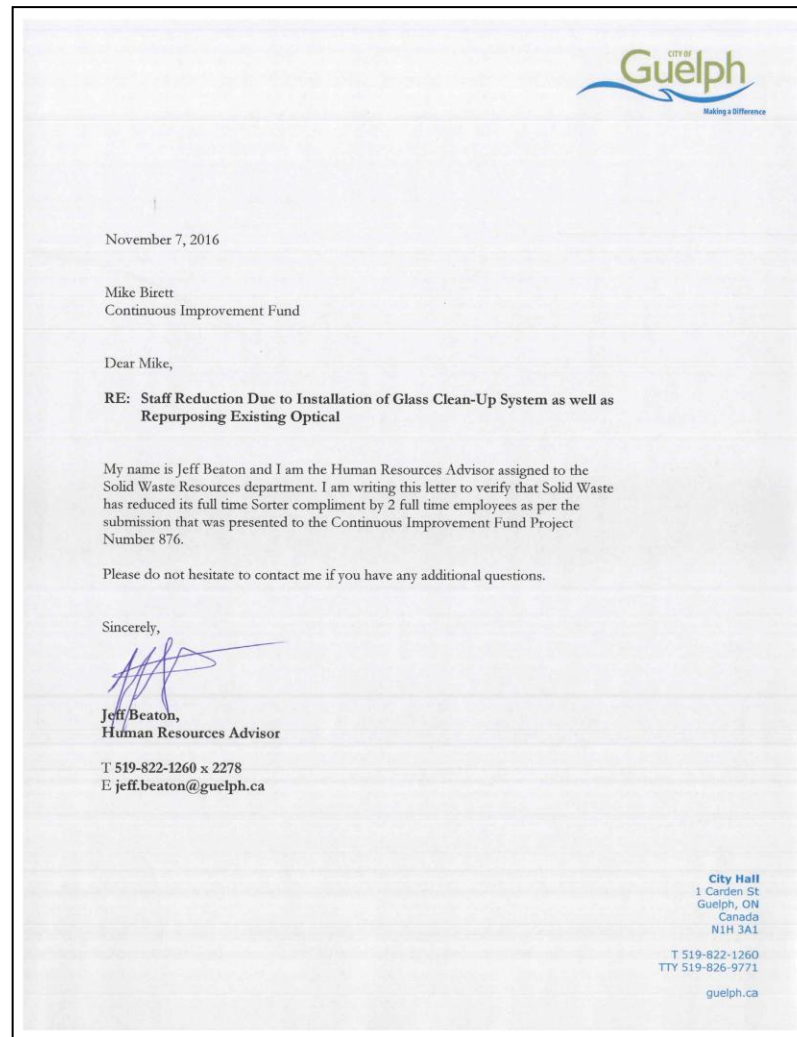
Appendix 1

City of Guelph Pre Project Audits conducted by Nexcycle								
Weight in Grams								
DATE	Weight	UNDER 3/8"	%-3/8	Usable Glass	%+3/8	NGR	%NGR	
5-Jan	5245	1185	23%	3015	57%	1045	20%	
7	5355	765	14%	3560	66%	1030	19%	
14	5320	425	8%	3730	70%	1165	22%	
3-Mar	5490	165	3%	4455	81%	870	16%	
4	4925	300	6%	3595	73%	1030	21%	
17	5910	730	12%	3830	65%	1350	23%	
24	5080	595	12%	3110	61%	1375	27%	
7-Apr	5170	390	8%	3300	64%	1480	29%	
14	5515	490	9%	3795	69%	1230	22%	
21	4820	865	18%	2875	60%	1080	22%	
26	6220	840	14%	3990	64%	1390	22%	
Totals	59,050	6750	11%	39,255	66%	13,045	22%	
	Total Weight	UNDER 3/8"	%-3/8	Usable Glass	%+3/8	NGR	%NGR	

Appendix 2

Summary of Post Project Audits Conducted by Nexcycle			
DATE	%-3/8	%+3/8	%NGR
18-Oct-16	17%	79%	4%
18-Oct-16	13%	81%	6%
19-Oct-16	23%	74%	4%
20-Oct-16	23%	73%	4%
21-Oct-16	29%	68%	4%

Appendix 3





Clean Glass After The Installation Of The Glass Clean Up System



New Glass Clean Up System Installed At the Guelph MRF